

What is claimed is:

1. A drive circuit for driving a switching element comprising:  
a high-side switching circuit connected between power  
5 supply lines;  
a low-side switching circuit connected in series with said  
high-side switching circuit through an output terminal leading to  
the switching element; and  
a voltage detector detecting a voltage appearing at the output  
10 terminal,  
wherein said low-side switching circuit is controlled to be  
turned off when the voltage detected by said voltage detector is lower  
than an off-decision voltage which is defined within a voltage range  
in which the switching element is in an off-state.

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2. A drive circuit as set forth in claim 1, wherein said low-side  
switching circuit includes an output transistor, a predriver driving  
the output transistor, a comparing circuit comparing the output  
voltage detected by said voltage detector with the off-decision voltage,  
20 and a logic circuit controlling an operation of the predriver base on a  
result of comparison in the comparing circuit.

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3. A drive circuit as set forth in claim 2, wherein the comparing  
circuit is implemented by a comparator.

4. A drive circuit as set forth in claim 2, wherein the comparing

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circuit includes a decision transistor having a control terminal into which the output voltage detected by said voltage detector is inputted.

5 5. A drive circuit as set forth in claim 1, wherein said voltage detector is implemented by a voltage divider made up of resistors.

6. A drive circuit for driving a switching element comprising:  
10 a high-side switching circuit connected between power supply lines;  
a low-side switching circuit connected in series with said high-side switching circuit through an output terminal leading to the switching element; and  
15 a voltage detector detecting a voltage appearing at the output terminal;  
wherein said high-side switching circuit is turned off when the voltage detected by said voltage detector is higher than an on-decision voltage which is defined within a voltage range in which the switching element is in an on-state.

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25 7. A drive circuit as set forth in claim 6, wherein said high-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the on-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

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8. A drive circuit as set forth in claim 7, wherein the comparing circuit is implemented by a comparator.

5 9. A drive circuit as set forth in claim 7, wherein the comparing circuit includes a decision transistor having a control terminal into which the output voltage detected by said voltage detector is inputted.

10 10. A drive circuit as set forth in claim 6, wherein said voltage detector is implemented by a voltage divider made up of resistors.

11. A drive circuit for driving a switching element comprising:  
15 a high-side switching circuit connected between power supply lines;

20 a low-side switching circuit connected in series with said high-side switching circuit through an output terminal leading to the switching element; and

25 a voltage detector detecting a voltage appearing at the output terminal;

wherein said low-side switching circuit is turned off when the voltage detected by said voltage detector is lower than an off-decision voltage which is defined within a voltage range in which the switching element is turned off, and

25 wherein said high-side switching circuit is turned off when the voltage detected by said voltage detector is higher than an

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on-decision voltage which is defined within a voltage range in which the switching element is turned on.

12. A drive circuit as set forth in claim 11, wherein said low-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the off-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

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13. A drive circuit as set forth in claim 11, wherein said high-side switching circuit includes an output transistor, a predriver driving the output transistor, a comparing circuit comparing the output voltage detected by said voltage detector with the on-decision voltage, and a logic circuit controlling an operation of the predriver base on a result of comparison in the comparing circuit.

14. A drive circuit as set forth in claim 13, wherein the comparing circuit includes a decision transistor having a control terminal into which the output voltage detected by said voltage detector is inputted.

15. A drive circuit as set forth in claim 11, wherein said voltage detector is implemented by a voltage divider made up of resistors.

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